BURNDY
LIBRARY

Chartered in 1941

GIFT OF
BERN DIBNER

Explaination of the Figure. Page 7.th

The darkened Sphere as will nearest fit the meridion l. b. at l. the Equator, will fall short of the opposide side of the Spheroid at o. to m. which is always more than 3 times the falling in of the Pole a. b.

And a Sphere as will nearest fit the meridion at b. the Pole, will always overrun the body of the Spheroid from t. to z. which is always more than 5 times the falling in of the Pole a. b. — Gravitation has no

no respect to Matter if these Circumstances will not make the meridional degrees measure more neare the Equator at L. and less towards the Pole at b. than to nearest fit the surface Curvature. and will begin at the Equator with the Radius to E. and finish at the Pole with the Radius but to e. not f. ———————

The thing must be as certain as that the Spheroid is more than the darkened Sphere. and less than the Sphere b. z. that nearest fit at b.

MSS

To make the Diameters then 3 times less variable than the extreme meridional Degrees, as has been done by Sir — Isaac Newton and the late Maj. Gen. Roy. (as would be the case did the meridional Degrees — begin and finish in the proportion of those two Spheres) subverts the Idea, and principle of Gravitation in the most obvious Sence, —

For supposing the Earth but a thin Shell of only 20 Miles thick, (for it is no more) even 10 Degrees square near 0.

will produce more than 7 Mil-
-lions of Cubic Miles of Matter.

This will Influence the direction
of a Plumbet in passing over
the Arc of the Meridion at L.
and Gravitate to the Centre K.
not h. that would nearest fit
the surface Curvature at L.

And the Plumbet in passing
over the Meridion at b. the
Poles will needs Gravitate
back to e. not f. that would
nearest fit the surface Curviture
is so Plain, that it is be-
-yond all Controversy. —

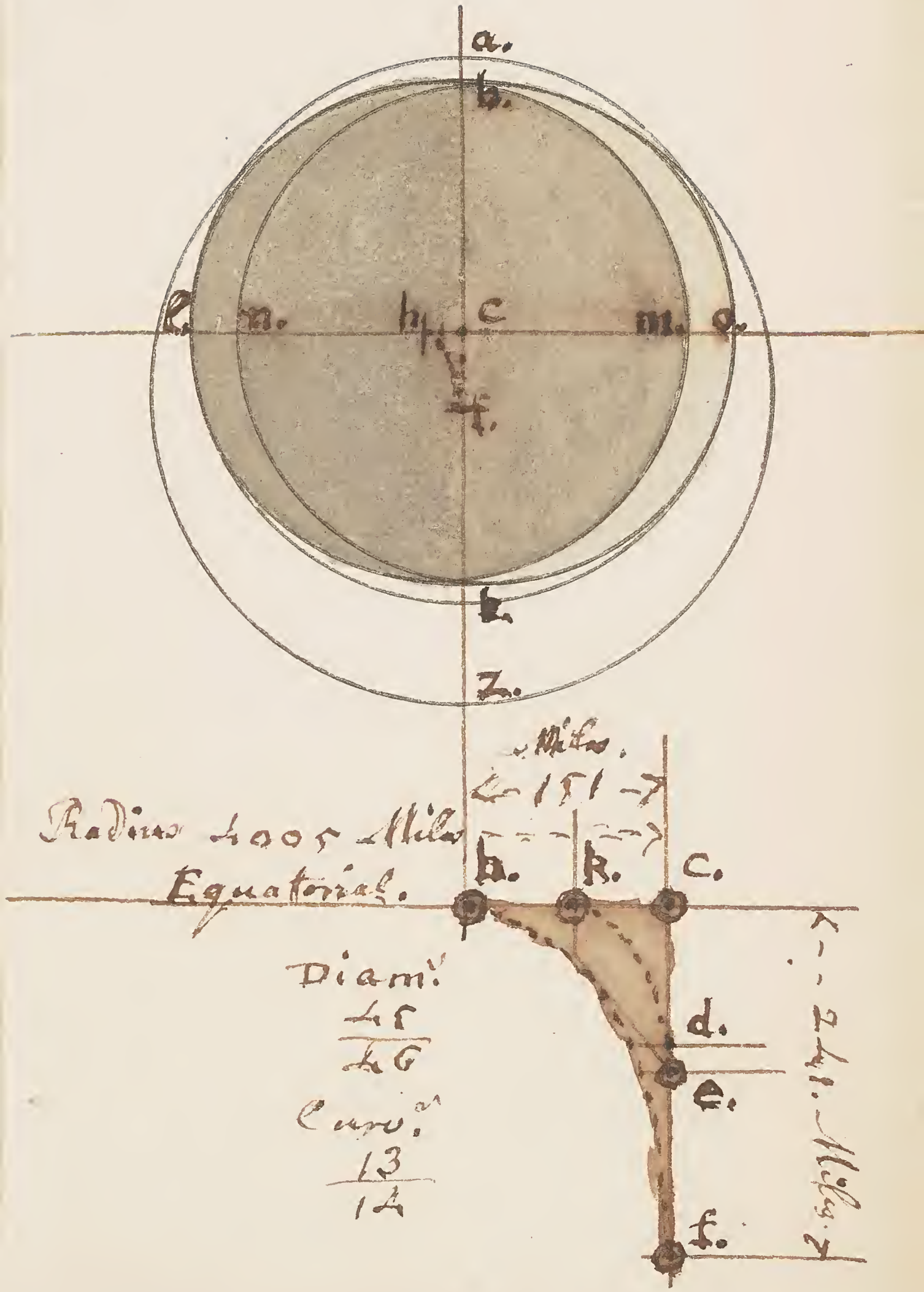
The formation of the 90 De-
-grees of the Meridion thereby
begining with these Radii to
K. and finishing with these
Radii but to e. always —
gives them in the proportion
of the Spheroids Diameter.

And the Radii from h. to f. as
would correspond to nearest
fit the surface Curvature is
full 3 times more variable
than is the extreme meridion-
-al Degrees; and not the Sp-
-heroids Diameter 3 times less
variables as has been falsely-
— given.

6.

For from the Spheroids surface to b. compared with from the surface to f. is nearly $\frac{13}{14}$. But from the surface to k. compared with from the surface to e. is nearly as $\frac{41}{46}$.

The great difference that does arise in the proportion of the Spheroids Diameters, by being in mean proportionals, instead of that as nearest fit the surface Curvature of the Spheroid, I shall shew in explaining the next Figure.


a.
b.
l.
n.
h.
c
m.
o.
f.
k.
z.
Miles.
151
Radius 4005 Miles
Equatorial.
b.
R.
c.
Diam.
45
46
Curv.
13
14
d.
e.
f.
Miles.

8.

Explaination of the Figure Page 15th

The Radii l. b. compared with the Radii b. f. as nearest for the extreme parts of the lined Curve l. b. is in the proportion nearly as $\frac{2}{3}$. But the Diameters of the lined Curve b. c. compared with l. c. is in the proportion as $\frac{9}{10}$

The Diameters of the dotted Curve o. c. compared with m. c. is in the proportion as $\frac{29}{30}$

Both the lined Curve, and the dotted Curve, I give them to be exactly the same length as each other.

Now supposing we have the 90 Degrees upon the meridion of the Earth to be ever so perfectly obtained, yet if we apply the length of the meridion C. b. to the surface of a Spheroid 3 times less variable than is the extreme meridional Degrees, it will be in the Lined Curve,

— And —

And the consiquence will be, it will be more in the semi-Axis from b. to o. and less in the semi-Equatorial Diameter from l. to m.

For supposing a. n. — n. o. o. b. and l. m. to be nearly equal to each other, yet if the lined curve at b. is raised to o. its evident it must fall short of l. to m. nearly $\frac{1}{3}$d part of the falling in of the Pole of the lined Curve l. b. and the circumscribing Quadrant

m. n. of the dotted curve m. o. It's Pole will fall in but from n. to o. nearly but the $\frac{1}{3}$ part of a. b. the falling in of the Pole of the lined curve l. b.

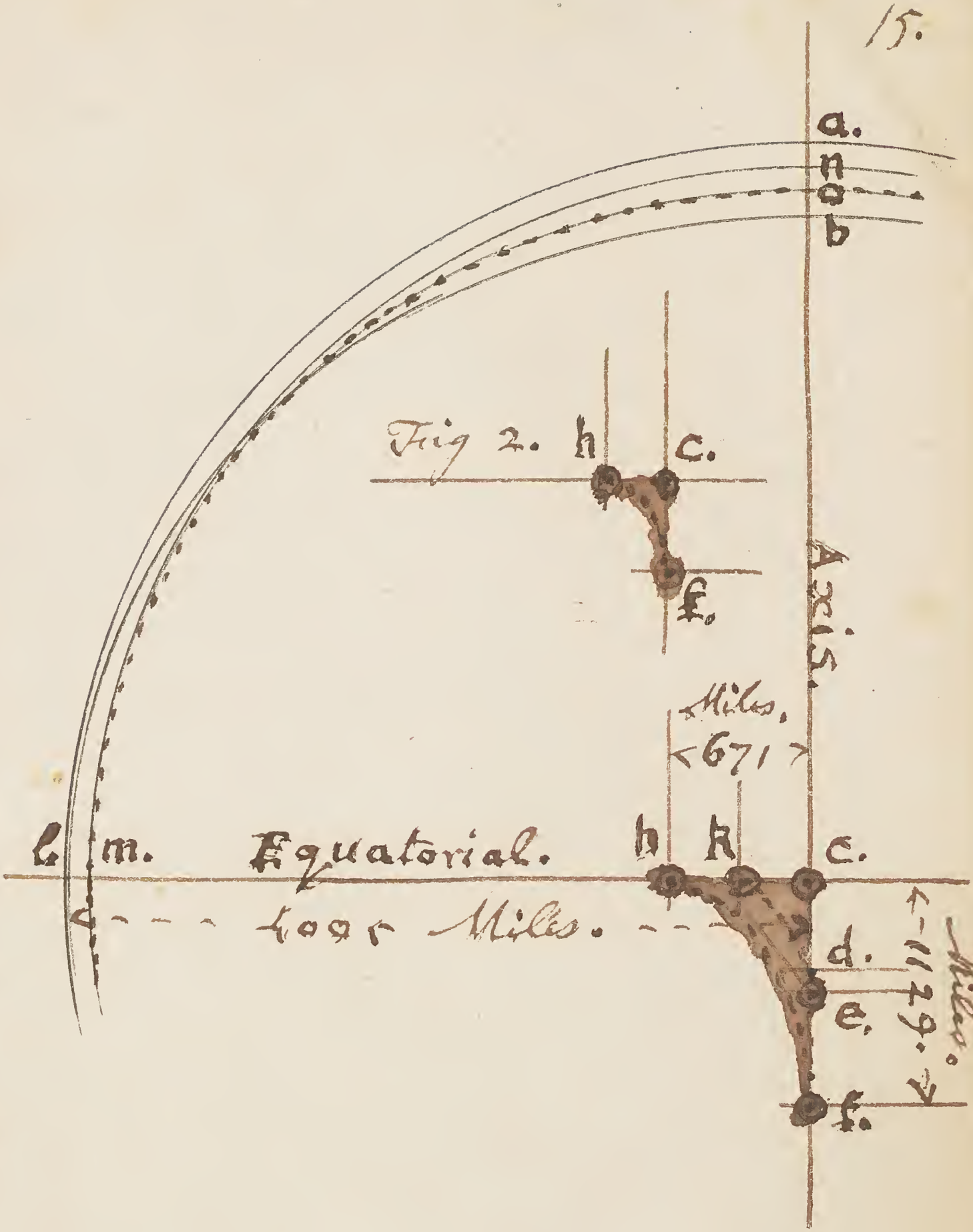
So very great is the Difference by the Meridional Degrees to begin and finish in the mean-proportionals k. e. to what it will be for the 90. meridionals to correspond with the surface Curvature on the Spheroid.

For both the Radii l. k. compared with the Radii b. e.

as is equal to the Diameters of the lined Curve C. b.

And also the Radii an. h. — compared with the Radii a. f. See Fig 2nd as nearest fit the surface Curvature of the dotted Curve, are both in the same proportion namely $\frac{9}{10}$

The Error thing that has been handed down to us, exists with in giveing the 90. Degrees of the Meridion to nearest fit the surface Curvature. So very great is the Importance to make a Clear distinction between the Proportions.


a.
n
o
b
Fig 2. h
c.
f.
Axis.
Miles.
671
l
m.
Equatorial.
h
k
c.
4005 Miles.
d.
e.
f.
1179.
Miles.

16.

This is the reason why the late Maj. Gen. Roy. makes his Conclusions, to give the Spheroid as $\frac{179}{180}$ in its Diameters, and consequently only 44 miles shorter in the Axis.

I from the very same Measurement at Lapland, and at the Equator, gives my Conclusions a Spheroid whose Diameters are as $\frac{45}{46}$ and consequently 172 Miles shortest in the Axis.

Tho. Williams.